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The Role of Health Anxiety in Online Health Information Search

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Abstract

This article is one of the first to empirically explore the relationship between health anxiety and online health information search. Two studies investigate how health anxiety influences the use of the Internet for health information and how health anxious individuals respond to online health information. An exploratory survey study with 104 Dutch participants indicates that health anxiety is related to an increase in online health information search. Moreover, results suggest that health anxious individuals experience more negative consequences from online health information search. Findings from an experimental study ($n = 120$) indicate that online health information results in greater worries among health anxious individuals compared to nonhealth anxious individuals only if the information stems from a trustworthy governmental Web site. Information from a less trustworthy online forum does not lead to greater worries among health anxious individuals. In sum, the Internet appears to play a pivotal role in the lives of health anxious individuals.

The Role of Health Anxiety in Online Health Information Search

The Internet has become an important source of health information.[1–3] Despite increasing numbers of online health information seekers,[4,5] little is known about their psychological characteristics. Most studies focused on sociodemographic determinants of online health information seeking,[2,6–10] the expectations, or the health status of users.[11,12] For example, Rice[12] has shown that medical conditions predict the search for health information online.

However, online health search may be determined not only by the *actual* health status of the users but also by their *fears* of having a serious illness.[13] Fear of having or developing a serious illness is known as health anxiety and, in its extremest form, hypochondriasis.[14] Health anxious individuals are preoccupied with thoughts about illnesses.[15,16] This preoccupation is commonly associated with a need to search for health information.[17] The Internet may serve as an easy accessible source to satisfy this need.

This article is one of the first to empirically explore the relationship between health anxiety and online health information search. Eastin and Guinsler found that health anxiety moderates the relationship between online health information seeking and health care utilization decisions.[13] The present studies explore if users' health anxiety predicts online health information seeking and the psychological consequences associated with obtained online health information.

Health Anxiety and the Use of Online Health Information

Health anxiety refers to fears that arise from misinterpretations of bodily symptoms as indicating severe illnesses.[18,19] To reduce their fears, health anxious individuals tend to perform safety behaviors.[17] These behaviors are intended to reassure the individual of being healthy and include the intensive search for health information.[20] Alongside checking physical symptoms or asking a medical expert, health anxious individuals may search the Internet for information related to their presumed illness. While every Internet user may search for health information, we assume that the need to search for online health information is greater among health anxious individuals. Not only may health anxious individuals search for more health information online, but they may also more actively engage in health-related activities online, including posting of health-related messages and responses. Therefore, we pose the following hypotheses:

H1: Health anxiety is related to increased levels of online health information search

H2: Health anxiety is related to actively posting health-related information online

Consequences of Online Health Information for Health Anxious Individuals

If health anxious individuals search the Internet for health information more frequently than individuals with normal

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health beliefs, the question remains as to how online health information affects health anxious individuals. According to cognitive-behavioral theory of health anxiety,[21] health anxious individuals respond differently to health-related information compared to nonhealth anxious individuals. Health anxious individuals misinterpret illness-related information as more catastrophic and perceive themselves to be at greater risk for medical complications than nonhealth anxious individuals.[22] They also tend to overestimate the seriousness of an illness when judging ambiguous health-related scripts.[23] Health anxiety is further characterized by an inability to be reassured by physicians[24] or by information indicating good health.[25]

These findings have implications for online health information search. When confronted with health information, health anxious individuals may not only pay more attention to this information but may also be more easily worried.[13,26] Further, regardless of what illness they presume to have, they may find and interpret information online in support of their anxiety. Therefore, we hypothesize:

H3: Health anxiety is related to more negative responses to online health information

It may be argued that the effects of online health information on health anxious individuals may be moderated by the credibility of the source. The quality and credibility of online health information has been criticized in the past.[2,27,28] A majority of online health information has shown to be of low quality or barely credible.[29] Source credibility has been shown to moderate the effect of health information. In general, online information from a trustworthy source has a stronger impact than online information from an untrustworthy source.[30]

It has been argued, however, that health anxious individuals struggle to account for the trustworthiness of an online source when responding to health information.[31] If this is the case, health anxious individuals may be equally worried by online health information from both trustworthy and less trustworthy sources. Therefore, we propose:

H4: Health anxiety is related to more negative responses to health information provided by both trustworthy and less trustworthy sources

More specifically, we expect that under conditions of both high and low trustworthiness, health anxious individuals will deem information about a disease more relevant, overestimate the likelihood that they are afflicted, suspect that they will get the disease in the future, and feel more worried about the disease.

Study 1

An online survey was conducted to test H1 to H3.

Method

Sample and procedure. To assess the influence of health anxiety on online health information search in the normal population, we used a convenience sample of nonclinical participants. The study was promoted in university classes of a Dutch university and participants were encouraged to forward the questionnaire to friends and relatives. Participants ranged from 18 to 30 years of age ($M = 21.02$, $SD = 2.19$). Most participants were university students (49 percent) or followed a study in higher professional education (22 percent) or preparatory scientific education (20 percent). Of the final sample ($n = 104$), 67 percent were females. The majority of participants (89.5 percent) used the Internet at least 6 days a week. In sum, the sample consisted of highly educated young adults with high levels of Internet use.

Measures. Health Anxiety: To measure health anxiety we used the Whitely Index.[32] This 14-item scale is the most widely used self-report inventory of hypochondriacal tendencies.[33] Answering categories ranging from 1 (*not true at all*) to 4 (*absolutely true*) were used, instead of the original dichotomous answering categories. Health anxieties are proposed to occur along a continuum,[14,16] which may be better reflected by response categories ranging from 1 to 4 than by dichotomous response categories. The additive scale resulted in a good Chronbach's alpha of 0.89. Participants' scores ranged from 1.00 to 3.43 ($M = 1.74$, $SD = 0.55$).

Online health information search: Searching for health information online was measured with the question, "How often do you search the Internet for health information concerning your own health?" Response categories ranged from 1 (*never*) to 9 (*every day*) ($M = 2.99$, $SD = 1.42$).

Posting of health-related information: To assess respondents' posting of health information via online forums, we asked participants, "How often did you post questions or answers in an online health forum in the last year?" with responses ranging from 1 (*never*) to 5 (*very often*) ($M = 1.14$, $SD = 0.51$). A total of 9.6 percent of all respondents reported having posted at least once in online health forums in the last year.

Consequences of obtaining health-related information: The perceived consequences of online health information search were assessed using six statements (true/not true) (adapted from the Pew Internet & American Life Project[27]). We asked participants to indicate how they felt after their last online health information search: overwhelmed by the amount of information they found online; confused by the information they found online; frustrated by a lack of information or an inability to find what they were looking for online; frightened by the serious or graphic nature of the information they found online; relieved or comforted by the information they found online; reassured that they could make appropriate health care decisions.

Control variables: Alongside demographic variables, we included two additional control variables, amount of Internet use and working in the health sector. Participants indicated how many days per week they used the Internet. Response categories ranged from 0 (*never*) to 7 (*7 days*) ($M = 6.55$, $SD = 0.90$). Participants also indicated how many hours per day they used the Internet ($M = 2.54$, $SD = 1.32$). Both variables were multiplied to calculate the number of hours per week each participant used the Internet ($M = 16.88$, $SD = 9.42$). Additionally, participants indicated whether or not they worked in the health sector.

Results

H1 predicted a positive relationship between health anxiety and frequency of online health information search. Likewise, H2 stated that health anxiety is related to increased

levels of posting information online. Regression analyses revealed that health anxiety was strongly associated with the search for health information online ($b = 1.17$, $\beta = 0.46$, $t(96) = 5.05$, $p < 0.01$) and the active posting of health-related information online ($b = 0.42$, $\beta = 0.45$, $t(96) = 4.92$, $p < 0.01$). In both regressions we controlled for gender, age, education, amount of Internet use, and working in the health sector. H1 and H2 were supported.

H3 predicted that health anxiety is related to more negative responses to online health information. A series of logistic regressions with the six dichotomous consequence items as dependent variables were conducted. All control variables were included in the regression. Health anxiety was most strongly related to feeling frightened by the seriousness of the information found online (OR = 12.52, 95% CI = 3.63–43.23, $p < 0.01$). Moreover, health anxiety predicted feeling overwhelmed (OR = 6.24, 95% CI = 1.91–20.38, $p < 0.01$) and confused (OR = 4.04, 95% CI = 1.49–10.93, $p < 0.01$) by the amount of information found online. Finally, health anxiety predicted feeling frustrated by a lack of information (OR = 3.13, 95% CI = 1.09–9.02, $p < 0.05$). No relationship between health anxiety and the positive consequences of online health information search (feeling relieved or reassured) was found. H3 was supported.

Study 2

To test H4, which stated that health anxiety is related to negative responses to online health information provided by both trustworthy and less trustworthy sources, a one-factorial (trustworthy vs. less trustworthy source) between-subjects online experiment was conducted.

Method

Sample. Participants were recruited via an online information system of a Dutch university. The final sample consisted of 120 participants. About 57 percent of the participants had obtained their highest degree in higher general continued education or preparatory scientific education, and about 24 percent in higher professional or scientific university education. Participants ranged from 17 to 68 years of age ($M = 24.17$, $SD = 8.66$), with 65.8 percent females.

Procedure. Initially, participants' levels of health anxiety were assessed. Thereafter, participants read an online text about a fictitious bacterial disease named "Lienalis." The text described the case of a Dutch individual who felt tired and listless, got stomach ache, and was finally diagnosed with Lienalis. The text continued to provide factual information about the bacterial disease so that participants learnt that Lienalis is associated with typical symptoms like stomach ache, loss of appetite, and changes in frequency of bowel movements (Appendix).

To manipulate trustworthiness, the text was presented either as an official announcement on the Dutch Public Health Service Web site (trustworthy source) or as a user posting on a popular Dutch health forum (less trustworthy source). Internet users tend to judge online health announcements from a knowledgeable expert as most credible.[2,28] Health announcements by official authorities are thus considered particularly trustworthy.[29] Participants were randomly assigned to one of the two conditions. After reading the online health information, participants were asked about the trustworthiness of the online source, and how much they worried about Lienalis. At the end of the experiment, participants were debriefed and informed that Lienalis was not a real disease.

Measures. Health Anxiety: As in Study 1, health anxiety was measured on a 4-point scale with the 14-items of the Whitely Index ($\alpha = 0.86$; $M = 1.79$, $SD = 0.52$).

Trustworthiness of online health information: To measure participants' trust in the online source, we asked them to indicate their agreement with eight items taken from a trustworthiness scale.[2] Participants responded to all items on a 5-point scale ranging from 1 (*do not agree at all*) to 5 (*absolutely agree*). All items were collapsed into a mean index ($\alpha = 0.86$; $M = 3.16$, $SD = 0.65$).

Negative responses to online health information: Four items measured participants' negative responses to the information presented online about Lienalis. Participants were asked to estimate on a 5-point scale the chances that they were currently suffering from Lienalis (1 (*very low chance*) to 5 (*very high chance*); $M = 1.59$; $SD = 0.89$) or that they will get Lienalis in the future (1 (*very low chance*) to 5 (*very high chance*); $M = 1.84$; $SD = 0.93$). We also asked participants to rate on a 5-point scale how much they felt worried right now about Lienalis (1 (*not worried at all*) to 5 (*very much worried*); $M = 1.9$; $SD = 0.95$) and how relevant they found the information about the new disease (1 (*not relevant at all*) to 5 (*very relevant*), $M = 2.91$; $SD = 0.97$).

Results

Treatment check

Confirming a successful manipulation, participants trusted online health information more when it was presented on the public health service Web site ($M = 3.39$; $SD = 0.59$) than when it was presented on the health-related online forum ($M = 2.9$; $SD = 0.63$; $t(118) = 4.32$; $p < 0.01$).

Hypothesis testing

We tested H4 with four moderated regressions.[34] The four variables reflecting participants' negative responses were regressed in separate hierarchical regressions on health anxiety (mean-centered) and trustworthiness (contrast-coded) in a first step, and on an interaction term of both variables in a second step. Results are displayed in Table 1.

In line with H4, we expected significant simple effects of health anxiety on the dependent variables under both trustworthy and less trustworthy conditions. However, in contrast to our expectations, results showed that health anxiety increased negative responses to health information obtained from a trustworthy source, but not from a less trustworthy source. The regression analyses (Step 1, see Table 1) suggest that health anxiety is a significant positive predictor of participants' perceived relevance of the information ($b = 0.36$, $t(116) = 2.10$, $p < 0.05$), estimations of being already infected by Lienalis ($b = 0.56$, $t(116) = 3.81$, $p < 0.01$), perceived risk of being infected in the future ($b = 0.63$, $t(116) = 4.14$, $p < 0.01$), and worrying about Lienalis ($b = 0.59$, $t(116) = 3.66$, $p < 0.01$). However, in all four regressions, the trustworthiness × health anxiety interaction term also emerged as an additional

Table 1. Results of the Hierarchical Regression Analysis of Trustworthiness of Online Health Information Regarding a New Disease and Health Anxiety on Negative Responses (Relevance, Chances of Having Disease, Worrying About Disease) ($N = 120$)

	Negative responses							
	Relevance		*Chance now*		*Chance future*		*Worry*	
Variable	*b*	*SE B*	*B*	*SE B*	*b*	*SE B*	*B*	*SE B*
Trustworthiness	0.24**	0.09	0.14†	0.08	0.13†	0.08	0.11	0.08
Health anxiety	0.36*	0.17	0.56**	0.15	0.63**	0.15	0.59**	0.16
Trustworthiness × health anxiety	0.38*	0.17	0.41**	0.14	0.41**	0.15	0.43**	0.16

Coefficients for trustworthiness and health anxiety were obtained in Step 1 of the regression. Coefficients for the interaction term were obtained in Step 2 of the regression. Relevance = perceived relevance of presented online information regarding Lienalis (R^2 Step 1 = 0.09**, ΔR^2 Step 2 = 0.04*), chance now = reported chance of having Lienalis (R^2 Step 1 = 0.13**, ΔR^2 Step 2 = 0.06**), chance future = reported chance of getting Lienalis in the future (R^2 Step 1 = 0.14**, ΔR^2 Step 2 = 0.05**), worry = worrying about Lienalis (R^2 Step 1 = 0.11**, ΔR^2 Step 2 = 0.06**).
†$p < 0.1$. *$p < 0.05$. **$p < 0.01$ (two-tailed).

significant predictor of participants' negative responses (see Table 1). This suggests that the trustworthiness of an online source moderates the influence of health anxiety on negative responses to online health information.

To examine this moderation more closely we conducted simple slope analyses. These analyses revealed that health anxiety led to more negative responses to online health information obtained from a trustworthy source (relevance: $b = 0.70$, $p < 0.01$; chance of being already infected: $b = 0.94$, $p < 0.01$; chance of getting infected: $b = 1.02$, $p < 0.01$; worry about disease: $b = 0.99$, $p < 0.01$). However, health anxiety did not lead to more negative responses to online health information obtained from a less trustworthy source (for all four negative response variables $b \leq 0.19$, $p \geq 0.39$). Figure 1 illustrates this simple slope pattern for participants' estimated chance of getting infected with Lienalis. The patterns obtained for the three other negative response variables were almost identical. Taken together, participants' health anxiety resulted in more negative responses to the presented health information, but only when this information stemmed from a trustworthy online source. H4 was thus not supported.

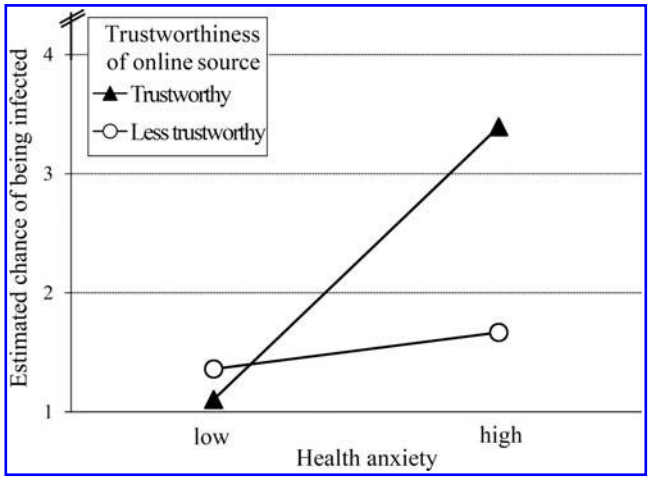

FIG. 1. Influence of health anxiety and trustworthiness of online source on participants' estimated chance of being infected with Lienalis.

Discussion

Despite public concerns and speculations concerning the role of online health information for health anxious individuals,[35] this relationship has rarely been investigated empirically. We initially fill this research gap by presenting two studies examining how health anxiety may influence online health information use and its consequences in a nonclinical sample.

The studies have three main findings. First, health anxiety was related to an increased use of online health information. Individuals who showed tendencies toward health anxiety utilized the Internet as a means to satisfy their health information needs. Individuals with higher levels of health anxiety were also more likely to actively post health-related questions and responses via online health forums. This finding, however, awaits replication because only a few participants in our sample posted information online.

A second finding of this study was that health anxiety was related to more negative responses toward online health information. In general, health anxious individuals appeared more frightened by the seriousness of online information and less reassured. This may indicate a reinforcing downward spiral.[36] Health anxiety may lead individuals to search the Internet for reassuring information. However, the information they find may provide more reasons to be concerned. Health-related worries may therefore be maintained rather than diminished by online health information search. This finding complements past research and suggests that health anxious individuals follow a threat-confirming strategy[37] that heightens their responsiveness to alarming information and makes them relatively immune to reassuring information.

However, the final finding of our studies was that health anxiety only resulted in more negative responses to online health information obtained from a trustworthy online source, and not from a less trustworthy source. This finding suggests that health anxiety is not triggered by any kind of online information but only by information stemming from trustworthy sources. The relationship between trust and health anxiety in the context of health information search should be investigated in more detail in future studies. For instance, which sources are perceived as trustworthy may differ considerably among individuals as has been shown in previous research.[38,39] Thus, the Web sites health anxious

individuals perceive as trustworthy may differ among subgroups of Internet users. Moreover, in the present experiment, participants were not explicitly searching for information regarding their health, but instead were confronted with information about a specific disease. Trust perceptions may differ when people are concerned with their own health and are desperately searching for helpful information online. In that case, people may also judge information from informal sources as trustworthy and helpful.

Limitations

The findings must be interpreted within the studies' limitations. The two studies were conducted with small convenience samples of Internet users. The samples included highly educated young adults, who are typically characterized as defining users of the Internet.[40] We cannot exclude the possibility that health anxious individuals from other samples (e.g., older individuals) will use different health information strategies. However, it may be concluded that health anxious Internet users use the Internet more to gain health-related information. Moreover, levels of health anxiety in our studies were rather mild. Replicating these findings with larger samples and with individuals with more extreme forms of health anxiety (e.g., clinical hypochondriasis) would be desirable to further advance this new area of research.

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References

1. Fox S, Jones S. (2009) The social life of health information. Washington DC: PEW Internet & American Life Project. www.pewinternet.org (accessed March 29, 2011).
2. Sillence E, Briggs P, Harris P, et al. Going online for health advice: changes in usage and trust practices over the last five years. Interacting with Computers 2007; 19:397–406.
3. Ybarra M, Suman M. Reasons, assessments and actions taken: sex and age differences in uses of Internet health information. Health Education Research 2008; 23:512–521.
4. Kummervold PE, Chronaki CE, Lausen B, et al. eHealth trends in Europe 2005–2007: a population-based survey. Journal of Medical Internet Research 2008; 10:e42.
5. Sillence E, Briggs P. (2007) Examining the role of the internet in health behaviour. In Joinson A, McKenna K, Postmes T, Reips U, eds. *The Oxford handbook of internet psychology*. Oxford, UK: Oxford University Press, pp. 347–360.
6. Cotton SR, Gupta SS. Characteristics of online and offline health information seekers and factors that discriminate between them. Social Science & Medicine 2004; 59:1795–1806.
7. Cline RJW, Hayes KM. Consumer health information seeking on the internet: the state of the art. Health Education Research 2001; 16:671–692.
8. Fox S, Rainie L. (2002) Vital decisions: how Internet users decide what information to trust when they or their loved ones are sick. Washington DC: PEW Internet & American Life Project. www.pewinternet.org (accessed March 29, 2011).
9. Morahan-Martin JM. How internet users find, evaluate, and use online health information: a cross-cultural review. Cyberpsychology & Behavior 2004; 7:497–510.
10. Zhao S. Parental education and children's online health information seeking: beyond the digital divide debate. Social Science & Medicine 2009; 69:1501–5.
11. Lemire M, Pare G, Sicotte C, et al. Determinants of internet use as a preferred source of information on personal health. International Journal of Medical Informatics 2008; 77:723–734.
12. Rice RE. Influences, usage, and outcomes of internet health information searching: multivariate results from the Pew surveys. International Journal of Medical Informatics 2006; 75:8–28.
13. Eastin MS, Guinsler NM. Worried and wired: effects of health anxiety on information-seeking and health care utilization behaviors. CyberPsychology & Behavior 2006; 9:494–498.
14. Williams PG. The psychopathology of self-assessed health: a cognitive approach to health anxiety and hypochondriasis. Cognitive Therapy and Research 2004; 28:629–644.
15. Marcus DK, Church SE. Are dysfunctional beliefs about illness unique to hypochondriasis? Journal of Psychosomatic Research 2003; 54:543–547.
16. Marcus DK, Gurley JR, Marchi MM, et al. Cognitive and perceptual variables in hypochondriasis and health anxiety: a systematic review. Clinical Psychology Review 2007; 27: 127–139.
17. Abramowitz JS, Moore EL. An experimental analysis of hypochondriasis. Behaviour Research and Therapy 2007; 45: 413–424.
18. Asmundson GJG, Taylor S, Cox BJ. (2001) *Health anxiety. Clinical and research perspectives on hypochondriasis and related conditions*. West Sussex, UK: John Wiley & Sons Ltd.
19. Salkovskis PM, Rimes KA, Warwick HM, et al. The health anxiety inventory: development and validation of scales for the measurement of health anxiety and hypochondriasis. Psychological Medicine 2002; 32:843–853.
20. Haenen MA, Schmidt AJM, Schoenmakers M, et al. Quantitative and qualitative aspects of cancer knowledge—comparing hypochondriacal subjects and healthy controls. Psychology & Health 1998; 13:1005–1014.
21. Salkovskis PM, Warwick HC. Morbid preoccupations, health anxiety and reassurance: a cognitive-behavioural approach to hypochondriasis. Behaviour Research and Therapy 1986; 24:597–602.
22. Hadjistavropoulos HD, Craig KD, Hadjistavropoulos T. Cognitive and behavioral responses to illness information: the role of health anxiety. Behavior Research and Therapy 1998; 36:149–164.
23. Haenen MA, de Jong PJ, Schmidt AJM, et al. Hypochondriacs' estimation of negative outcomes: domain-specifcity and responsiveness to reassuring and alarming information. Behaviour Research and Therapy 2000; 38:819–833.
24. Brown HD, Kosslyn SM, Delamater B, et al. Perceptual and memory biases for health-related information in hypochondriacal individuals. Journal of Psychosomatic Research 1999; 47:67–78.
25. Owens KMB, Asmundson GJG, Hadjistavropoulos T, et al. Attentional bias toward illness threat in individuals with elevated health anxiety. Cognitive Therapy and Research 2004; 28:57–66.
26. White RW, Horvitz E. Cyberchondria: studies of the escalation of medical concerns in web search. ACM Transactions on Information Systems 2009; 27:1–37.

27. Fox S. (2006) *Online health search 2006*. Washington DC: PEW Internet & American Life Project. www.pewinternet.org (accessed March 29, 2011).
28. Sillence E, Briggs P, Harris P, et al. How do patients evaluate and make use of online health information? Social Science & Medicine 2007; 64:1853–1862.
29. Eysenbach G, Köhler C. How do consumers search for and appraise health information on the world wide web? Qualitative study using focus groups, usability tests, and in-depth interviews. British Journal of Medicine 2002; 324: 573–577.
30. Briggs P, Burford B, De Angeli A, et al. Trust in online advice. Social Science Computer Review 2002; 20:321–332.
31. Köhler S. (2005) *A look into cyberchondria: using the internet to diagnose your health symptoms*. Retrieved 2010, September 22. www.associatedcontent.com/article/4068/a_look_into_cyberchondria_using_the.html?cat=5 (accessed March 29, 2011).
32. Pilowsky I. Dimensions of hypochondriasis. British Journal of Psychiatry 1967; 113:89–93.
33. Hiller W, Reif W, Fichter MM. Dimensional and categorical approaches to hypochondriasis. Psychological Medicine 2002; 32:707–718.
34. Aiken LS, West SG. (1991) *Multiple regression: testing and interpreting interactions*. Newbury Park, London, UK: Sage.
35. Internet makes hypochondria worse. (2002) Retrieved 2010, September 22. www.webmd.com/balance/features/internet-makes-hypochondria-worse (accessed March 29, 2011).
36. Slater MD. Reinforcing spirals: the mutual influence of media selectivity and media effects and their impact on individual behavior and social identity. Communication Theory 2007; 17:281–303.
37. Smeets G, de Jong PJ, Mayer B. If you suffer from a headache, then you have a brain tumour: domain-specific reasoning "bias" and hypochondriasis. Behaviour Research and Therapy 2000; 38:763–776.
38. McKnight DH, Choudhury V, Kacmar C. The impact of initial consumer trust on intentions to transact with a web site: a trust building model. Journal of Strategic Information Systems 2002; 11:297–323.
39. Mackert M, Kahlor L, Tyler D, et al. Designing e-Health interventions for low health literate culturally diverse parents: addressing the obesity epidemic. Telemedicine and e-Health 2009; 15:672–677.
40. Lenhart A, Purcell K, Smith A, et al. (2010) *Social media and young adults. Social media and mobile internet use among teens and young adults.* Washington DC: PEW Internet & American Life Project. www.pewinternet.org (accessed March 29, 2011).

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Appendix

A New Disease: Lienalis (Stimulus Text About Fictitious Disease Applied in Study 2 [Translated from Original Dutch Version])

When Marjolein de Wit (name changed to protect privacy) woke up in her apartment in Utrecht 3 months ago, she felt tired, listless, and suffered from stomach pain. "I've been having an uncomfortable feeling in my stomach for a week, but that morning I had real pain," said Marjolein. "Strangely enough, I could still eat normally during the last week, despite suffering from these pains." At first, Marjolein did not worry much about the stomach pain. "I did not think it would be anything serious and that it was due to stress." That morning, however, Marjolein discovered traces of blood in her excrements and decided to see a doctor. This was a good decision because the doctor diagnosed that Marjolein was suffering from a recently discovered disease: Lienalis.

This new disease has been discovered recently by the Dutch Center for Disease Control. In many cases Lienalis is lethal. Lienalis leads to an intestinal hyperacidity, which in turn severely decreases the bowel functions.

Further research is still needed to uncover what exactly causes Lienalis. However, from existing research, it seems that a typical Western diet—low in fiber and high in animal fats—may contribute to this disease. Other factors such as excessive alcohol intake, obesity, and insufficient physical exercise may also stimulate Lienalis.

Patients who are suffering from Lienalis typically report the following symptoms:

- change in the frequency of passing motion
- blood in the excrements
- stomach pain
- intestinal pain
- less appetite
- congestion

No cure has yet been discovered for Lienalis, but with the right medication the intestinal hyperacidity can be decelerated. It is strongly advised to consult a physician whenever two or more of the above-mentioned symptoms are experienced.